Financial Efficiency Performance of State Bank of Bikaner and Jaipur with special reference to Udaipur district

Dr. O. P. Jain[1], Khanika Choudhary[2]

Abstract: *The structure of Indian banking has substantially changed over the past decades, partially as a result of adoption of new technologies and process of reforms and accompanying deregulation has embodied an incentive for bank management to focus on improving efficiency, especially given the more competitive banking environment. In the face of increased competition, the banks have to operate more efficiently in order to sustain and perform better. In the context of increased competition and the importance of banks in financial markets, it becomes very much essential to evaluate whether these banks operate efficiently. Primarily, there are two chief reasons to measure the efficiency of banking institutions. Firstly, this assists to identify the most efficient banks and benchmarks the relative efficiency of individual banks against the most efficient banks. Secondly, it helps to evaluate the impact of various policy measures on the performance of banks. This study aims to examine the efficiency of a public sector bank SBBJ banks during 2009-2013 by utilizing Data Envelopment Analysis (DEA). This paper follows the DEA nonparametric approach. In this regard, Farrell (1957) originally developed this non-parametric efficiency approach. The DEA is non-parametric in the sense that it simply constructs the frontier of the observed input-output ratios by linear programming techniques (Iqbal and Molyneux (2005). For an introduction to DEA methodology, see for instance Coelli et al. (1998) and Thanassoulis (2001).*

Key words: *Data Envelopment Analysis, banks, Efficiency, Performance.*

I. Introduction

The Stalwart of Indian Financial community nodded their heads sagaciously when Prime Minister Mr.Manmohan Singh said in his speech "If there is one aspect in which we can confidently assert that India is ahead of China it is the robustness and soundness of banking system". Indian banks have been rated higher than Chinese banks by the international rating agency Standards & Poor's.

The genesis of State Bank of Bikaner and Jaipur dates back to the year 1943-44, when the Bank of Jaipur Ltd. and the Bank of Bikaner Ltd. came into existence. In 1960, both banks were incorporated as subsidiaries of State Bank of India and named as State Bank of Bikaner and State Bank of Jaipur. On January 1, 1963, both banks were merged into one entity viz. State Bank of Bikaner and Jaipur. The constitution, capital, management and other matters pertaining to the Bank are governed by the provisions of SBI (Subsidiary Banks) Act, 1959. 75% of the shares of SBBJ are held by SBI and the remaining by institutions and general public. The Bank took over the business of the Govind Bank Pvt. Ltd, Mathura on 25th April, 1966. SBBJ went public in the year 1997-98 with an issue of ₹12.21 lakh shares of ₹100 each at a premium of ₹440/-. SBBJ is the only public sector bank with headquarter in Rajasthan.

At the time of incorporation, the Bank had a business of ₹45 crore, net profit of ₹7.5 lakh and a network of 124 branches (96 in Rajasthan). By March 2013 the business of the Bank increased to 1,30,590crore,net profit stood   at ₹730.24crore.

The number of branches increased to 1049 (862 in Rajasthan) as on 30.09.2013. SBBJ had sponsored three Regional Rural Banks viz. Marwar Gramin Bank (set up in 1976), Sriganganagar Kshetriya Gramin Bank (1984) and Bikaner Kshetriya Gramin bank (1985). These were merged into single RRB viz. MGB Gramin Bank in June 2006. On 25.02.2013 the MGB Gramin Bank (RRB sponsored by SBBJ) and Jaipur Thar Gramin Bank (RRB sponsored by UCO Bank) were amalgamated into a single Regional Rural Bank named 'Marudhara Gramin Bank' sponsored by SBBJ with Head office at Jodhpur. The Bank shoulders Lead Bank responsibility in 9 districts of the State.

II. Review Of Literature

According to P. C. Tripathi, Measurement May be defined as "The assignment of numerals to characteristics of objects, persons, states or events accounting to rules. What is measured is not the object, person, state or event itself but some characteristics of it. When objects are counted, for example, we do not measure the object itself but only it's characteristic of being present. We never measure people, only their age, height, weight or some other characteristics."

According to Michael Mascon "Performance is dependent on effort, abilities, traits and the individual's perception of his role." While measuring the performance of a firm or an enterprise we need a measuring unit.

Human aims and beliefs are mostly realized through the establishment of diverse kinds of associations. All associations were established for fulfillment of some goals and objectives. Thus association needs performance measurement to find out as to how much is organization has achieved by its course of action for its targets. The financial appraisal is a vital unit to measure the performance of firms. Therefore, financial statements are prepared to serve the objective.

According to Eldon S. Hendriksen, "The primary focus of financial reporting is information about an enterprise's performance provided by measures of earnings and its components."

Erich A. Helfert rightly remarks, "The measurement of business performance is more complex and difficult. Since it must deal with the effectiveness with which capital is employed, the efficiency and profitability of operations, and the value and safety of various claims against the business."

Sanjeev, Gunjan M (2006) conducted study on "Does Banks' Size Matter in India?"This study has evaluated the efficiency of the public sector banks operating in India for a period of five years (1997-2001) using the Data Envelopment Analysis (DEA). Further, it is investigated if there exists any relationship between the efficiency and size of the banks. The results of the study suggest that no conclusive relationship can be established between the efficiency and size of the banks.

Taneja & Singh (2004) argued that the efficiency of intermediating (financial Institutions) depends on the width, depth and diversity of the financial system. They measured the efficiency and financial performance of Public Sector Bank since commencement of the opting for the LPG programmed. For the purpose of analysis they studied the impact of banking sector reforms mainly on all public sector banks sexcept SBI and its Associate, by data envelopment analysis with intermediation approach.

Das, Abhima, Ghosh, Saibal (2006) conducted study on "**Financial Deregulation and Efficiency: An Empirical Analysis of Indian Banks during the Post Reform Period."**This study investigates the performance of Indian commercial banking sector during the post reform period 1992–2002. Several efficiency estimates of individual banks are evaluated using nonparametric Data Envelopment Analysis (DEA).. The analysis links the variation in calculated efficiencies to a set of variables, i.e., bank size, ownership, capital adequacy ratio, non-performing loans and management quality. The findings suggest that medium-sized public sector banks performed reasonably well and are more likely to operate at higher levels of technical efficiency. A close relationship is observed between efficiency and soundness as determined by bank's capital adequacy ratio. The empirical results also show that technically more efficient banks are those that have, on an average, less nonperforming loans.

 Objective of study
- To find the performance measures for SBBJ in Udaipur District
- To identify the efficient rural and urban branches of SBBJ in Udaipur district.
- To measures the efficiency of rural and urban branches of SBBJ in Udaipur district using Data Envelopment Analysis
- To compare the region and branch wise efficiency of rural and urban branches of SBBJ in Udaipur

*Data is collected over the period 2009-2013

HYPOTHESIS FOR THE STUDY
H1: There is no signifcant difference in efficiencies among Urban branches of SBBJ in Udaipur district
H2: There is no signifcant difference in efficiencies among Rural branches of SBBJ in Udaipur district
H3: There is no signifcant difference between efficiency of Rural and Urban branches of SBBJ in Udaipur district

4.3 COMPARATIVE ANALYSIS
1. URBAN v/s RURAL

Table 1: Efficiency Score table (2009-2013)

Type	Branch Name	Year				
		2009	**2010**	**2011**	**2012**	**2013**
Urban	Treasury branch	1.00000	1.00000	1.00000	1.00000	1.00000
	Pratap nagar	0.79129	0.71110	0.75948	0.71696	0.71771
	RNT branch	1.00000	1.00000	1.00000	1.00000	1.00000
	Bada bazar	0.86551	0.82419	0.81628	0.83461	0.79880
	Suraj pole	1.00000	1.00000	0.87000	0.90724	0.86826
	Hiran magri Sector 11	0.85666	0.81742	1.00000	1.00000	0.72110

	Udaipur Sector 4	0.75053	0.74970	0.74297	0.73609	0.71453
	Udaipur SSI branch	1.00000	1.00000	1.00000	1.00000	1.00000
	New Fatehpura branch	0.80904	0.76184	0.74929	0.70894	0.70967
	Udaipur Mewar Industrial Branch	1.00000	0.97719	0.88621	1.00000	0.98461
Rural	Slumber	1.00000	1.00000	1.00000	1.00000	1.00000
	Zincs smelter	1.00000	0.98416	0.91944	0.90523	0.90064
	Kun Branch	0.93980	0.98962	0.94115	0.61312	0.84188
	Lakharwas Branch	0.92960	0.86514	1.00000	1.00000	0.81621
	Rishabdev Branch	0.00000	0.99700	1.00000	1.00000	1.00000
	Thamla Branch	1.00000	1.00000	1.00000	0.87959	1.00000
	Badgaon Branch	1.00000	0.99905	0.92491	0.85264	0.83045
	Badi	0.90443	0.85446	0.79364	0.86378	0.78989
	Dabok	1.00000	1.00000	1.00000	0.63827	1.00000
	Nahar Magra Bajaj Nagar	0.94003	0.97023	0.84834	0.82515	0.89088

Above table represents efficiency of rural and urban branches of State Bank of Bikaner and Jaipur over a period of five years viz.2009 to 2013. The table indicates clearly the efficiency of the branches in a particular year. This enables the user to compare interbank efficiency of rural or urban branches and also comparison of a rural branch with its urban counterpart in the same year.
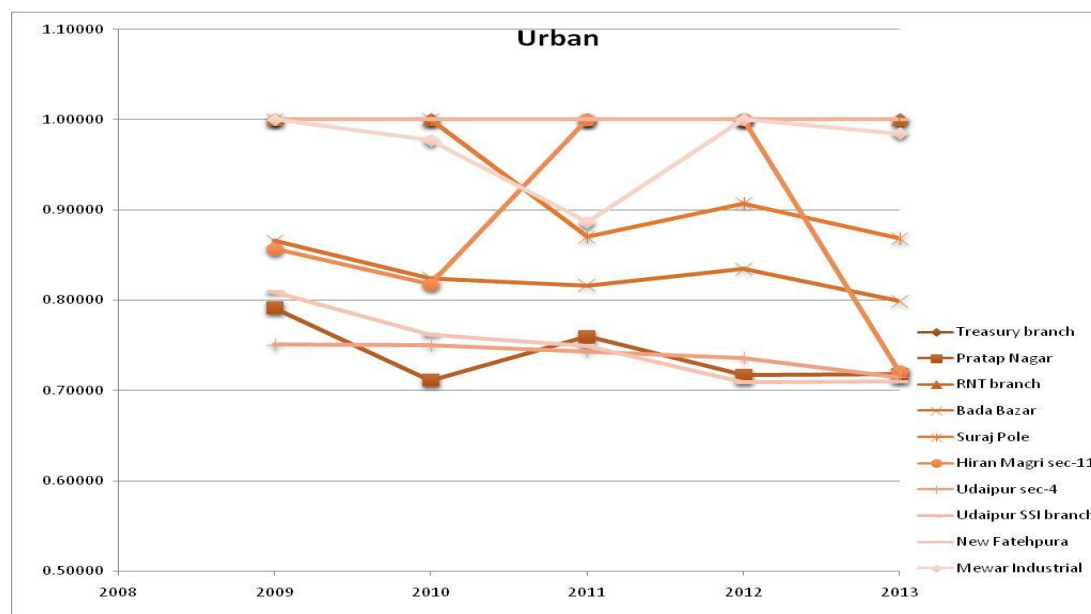

Figure 1: Urban Efficiency Chart

The graph (Figure 1) divides the banks into two major categories where majority of the banks are in the range of 80 to 100 percent, only 3 are in the range of 70 to 80 percent. This indicates a strong efficiency pattern in the urban branches, this indicates that none of the banks are operating below 70 percent value. Treassury branch has a steady score of 100 percent, indicating that this branch is utilizing its inputs to a maximum level. Pratapnagar branch has alternate phases of increasing and decreasing values which however, remained in the range of 70 to 80 percent. RNT branch again has a steady score of 100 percent indicating strong utilization of input resources. Bada bazar is operating in the range of 80 to 90 percent. There is a gradual decline, except in the year 2012, from 86 percent to 79 percent. Surajpole, after having performed at 100 percent efficiency level for continuous two years, 2009,2010 dropped to 87 percent 2011 then increasing to 90 percent in 2012 and finally settling at 86 percent , thus indicating a volatility in efficiency , however in a close range. Hiran Magri has shown strong fluctuations in efficiency levels, which was 85 percent in the beginning, which went upto 100 percent in the middle of the period and finally settled at 72 percent, curve for this branch roughly follows an

inverted U shape, with peak at the middle. Sector 4 has a steady performance in the range of 71 to 75 percent. Such performance is indicative of contentment and lack of vigor to growth. SSI branch has a steady score of 100 percent, indicating maximum utilization of its resources. New Fatehpura has good performance in the initial years which decline in the later part of the period. Mewar Industrial area branch has 100 percent efficiency in 2009, which gradually declined to 88 percent in 2011, again increasing to 100 percent in 2012 and finally settling for 98 percent in the year 2013.
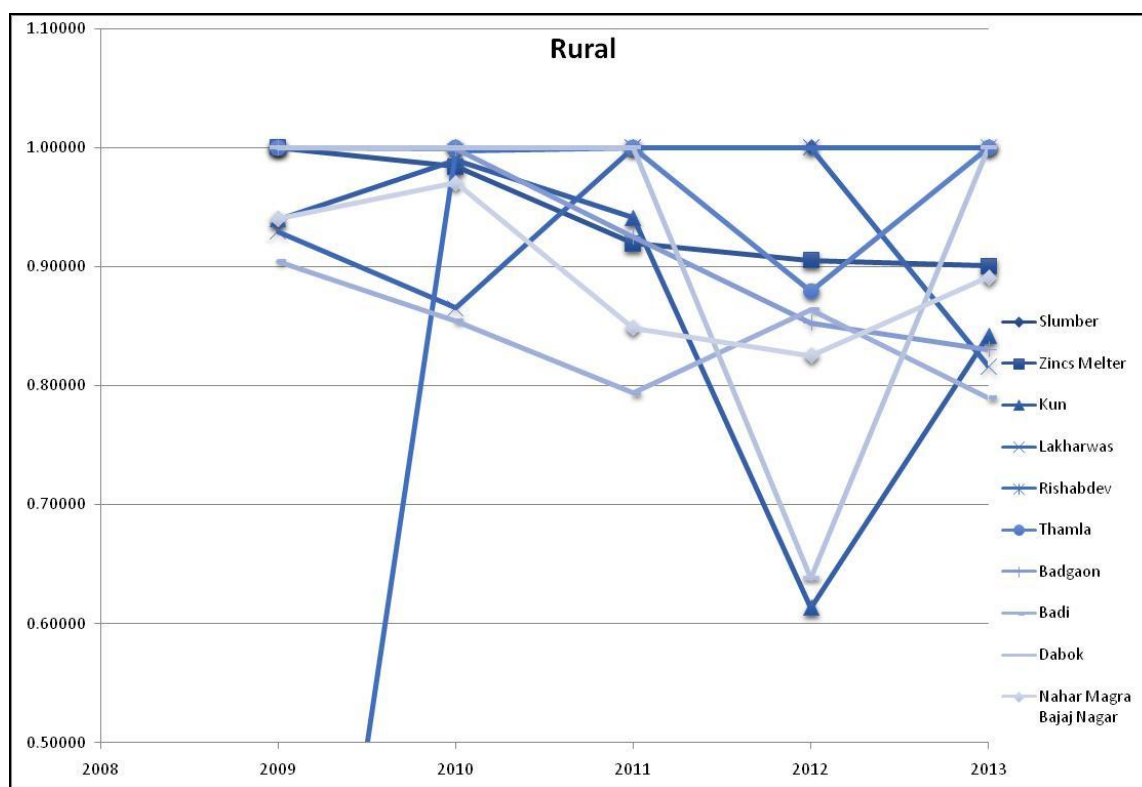

Figure 2: Rural Efficiency Chart

The above chart shows the trends in the efficiency of the rural branches. Majority of the banks are in the range of 80 to 100 percent efficiency. Rishabhdev was not started in the year 2009 hence its efficiency is shown as 0 in 2009. The graph clearly shows that the branch like Salumber shows a consistent score of 100 percent efficiency. Zinc Smelter was 100 percent efficient in the beginning of the period, but in five years there has been a consistent and steady decline in its efficiency. From 100 percent to a score of 90 percent decline is steady. Performance of Kun is steady from the period 2009 to 2011, during this time its efficiency remained between 93 to 94 percent. However, in 2012 there was a sharp decline to 61 percent. This finally reached 84% in 2013. For Lakharwas branch the efficiency score is in the band of 81 to 100 percent. In the year 2012-13 performance sharply declined from 100 percent to 81 percent. Rishabhdev started in the year 2009, since the beginning maintained its efficiency score at 100 percent. Thambla branch has a consistent score of 100 percent since its inception however there is a sharp decline of 11 percent in the year 2012. Badgaon branch was performing at a 100 percent efficiency level in the year 2009, after which it has experienced a continuous and steady decline. There is a decline of 17 percent in 5 years. Badi, performance of this branch remained in the band of 78 to 90 percent. Efficiency follows approximately a wave pattern, with alternate increasing and decreasing phases. Dabok branch has a steady score of 100 percent except in the year 2012 in which the performance has fallen to 63 percent. Nahar Magra Bajaj Nagar efficiency pattern is cyclic in nature. Efficiency is increasing in the year 2009-10, declining in 2011-12 and finally increasing in 2013.

III.   Statistical Test

Testing of H1 and H2
H1: There is no signifcant difference in efficiencies among urban branches of SBBJ in Udaipur district
H2: There is no signifcant difference in efficiencies among Rural branches of SBBJ in Udaipur district
To test these, hypothesis, the data calculated from the above DEA analysis is used as input for statistical testing (Table 42 and 43). The investigation of banks' efficiency based on their geographical regions is of considerable interest for the assessment of the possible impact of regional characteristics on efficiencies of bank branches.

Table: Efficiency Score Table

Urban branch efficiency Score										
Year	**U1**	**U2**	**U3**	**U4**	**U5**	**U6**	**U7**	**U8**	**U9**	**U10**
2009	1.00	0.79	1.00	0.87	1.00	0.86	0.75	1.00	0.81	1.00
2010	1.00	0.71	1.00	0.82	1.00	0.82	0.75	1.00	0.76	0.98
2011	1.00	0.76	1.00	0.82	0.87	1.00	0.74	1.00	0.75	0.89
2012	1.00	0.72	1.00	0.83	0.91	1.00	0.74	1.00	0.71	1.00
2013	1.00	0.72	1.00	0.80	0.87	0.72	0.71	1.00	0.71	0.98
Rural branch efficiency Score										
Year	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**
2009	1.00	1.00	0.94	0.93	0.00	1.00	1.00	0.90	1.00	0.94
2010	1.00	0.98	0.99	0.87	1.00	1.00	1.00	0.85	1.00	0.97
2011	1.00	0.92	0.94	1.00	1.00	1.00	0.92	0.79	1.00	0.85
2012	1.00	0.91	0.61	1.00	1.00	0.88	0.85	0.86	0.64	0.83
2013	1.00	0.90	0.84	0.82	1.00	1.00	0.83	0.79	1.00	0.89

The DEA is non-parametric in the sense that it simply constructs the frontier of the observed input-output ratios by linear programming techniques. A non-parametric statistical test using Kruskal-Wallis were done. The Kruskal-Wallis test is equivalent to the one-way ANOVA, and thus allows us to examine possible differences between two or more groups.

The Kruskal-Wallis test is the nonparametric test and an extension of the Mann-Whitney U test to allow the comparison of more than two independent groups. It is used when we wish to compare three or more sets of scores that come from different groups. It is important to note that the Kruskal-Wallis test is an *omnibus* test statistic and cannot tell you which specific groups were significantly different from each other; it only tells you that at least two groups were different.

Assumptions

A Kruskal-Wallis test is only appropriate where the following two assumptions are met:

- Assumption #1: Your dependent variable should be measured at the ordinal or interval/ratio level. Examples of ratio variables include revision time (measured in hours), intelligence (measured using IQ score), exam performance (measured from 0 to 100), weight (measured in kg), and so forth.
- Assumption #2: Your independent variable should consist of two or more categorical, independent groups. Typically, a Kruskal-Wallis test is used when you have three or more categorical, independent groups, but it can be used for just two groups (i.e., a Mann-Whitney U test is more commonly used for two groups). Example independent variables that meet this criterion include ethnicity (e.g., 3 groups: Caucasian, African American and Hispanic), physical activity level (e.g., 4 groups: sedentary, low, moderate and high), profession (e.g., 5 groups: surgeon, doctor, nurse, dentist, therapist), and so forth.

As the Kruskal-Wallis test does not assume normality in the data and is much less sensitive to outliers, it can be used when these assumption have been violated and the use of the one-way ANOVA is inappropriate. In addition, if your data is ordinal, you *cannot* use a one-way ANOVA, but you can use this test.

SPSS version 19 is used to perform a Kruskal-Wallis test. The Kruskal-Walls test use the following steps:
- Open the dataset in SPSS to be used for the Kruskal-Wallis Test analysis
- Click Analyze, click (mouse over) Nonparametric Tests, and then click K
- Independent-Sample
- You should now be in the Test for Several Independent Samples dialog box
- Click on your (*Test Variable*), and click _ to move it to the Test Variable List: box
- Click on your (*Grouping Variable*), and click _ to move it to the Grouping Variable: box
- Click Define Range
- Type 1 as the Minimum value for Group
- Type 5 (for this example) as the Maximum value for Group
- Click Continue
- Click Options
- Under Statistics , Select [Ö] Descriptive

- Click Continue
- Be sure Kruskal-Wallis H is checked in the Test Type area.

The test statistics reported in Table 43 indicate that efficiencies significantly differ across the ten Urban branches ($p<0.05$). Moreover the same conclusion can be drawn for rural branches as Kruskal-Wallis H teat value is not found significant at 5 percent level. Therefore both rural and urban bank branches efficiencies are statistically differ across each geographical region.

Table : Descriptive Statistics with Kruskal-Wallis H test

Urban Branches										
	U1	U2	U3	U4	U5	U6	U7	U8	U9	U10
N	5	5	5	5	5	5	5	5	5	5
Mean	1.00	0.74	1.00	0.83	0.93	0.88	0.74	1.00	0.75	0.97
Max	1.00	0.79	1.00	0.87	1.00	1.00	0.75	1.00	0.81	1.00
Min	1.00	0.71	1.00	0.80	0.87	0.72	0.71	1.00	0.71	0.89
Std.D	0.00	0.03	0.00	0.02	0.07	0.12	0.01	0.00	0.04	0.05
Kruskal-Wallis H (Significance at 5 percent level.) Chi square = 40.619 and p=0.000										
Rural Branches										
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
N	5	5	5	5	5	5	5	5	5	5
Mean	1.00	0.94	0.86	0.92	0.80	0.98	0.92	0.84	0.93	0.90
Max	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.90	1.00	0.97
Min	1.00	0.90	0.61	0.82	0.00	0.88	0.83	0.79	0.64	0.83
Std.D	0.00	0.04	0.15	0.08	0.45	0.05	0.08	0.05	0.16	0.06
Kruskal-Wallis H (Significance at 5 percent level.) Chi square = 19.198 and p=0.024										

Hypothesis Test summary: Independent Samples Kruskal-Wallis Test

Branch Type	Null / Alternate	Hypotheses	Accepted / Rejected
Urban	Null	$H1_0$: There is no signifcant difference in efficiencies among urban branches of SBBJ in Udaipur district	Rejected
	Alternate	$H1_1$: There is a signifcant difference in efficiencies among urban branches of SBBJ in Udaipur district	*Accepted*
Rural	Null	$H2_0$:There is no signifcant difference in efficiencies among Rural branches of SBBJ in Udaipur district	Rejected
	Alternate	$H2_1$:There is signifcant difference in efficiencies among Rural branches of SBBJ in Udaipur district	*Accepted*
The significance level is 0.05			

Testing of H3

H3: There is no signifcant difference between efficiency of Rural and Urban branches of SBBJ in Udaipur district

To test this hypothesis, Mann-Whitney U test is employed. The Mann-Whitney U is a relevant test for two independent samples coming from populations having the same distribution. This test is equivalent to the independent groups T-test . The data violate the stringent assumptions of the independent group t-test, there for it is decided to use Mann-Whitney U.

The Mann-Whitney U test is used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed. For example, you could use the Mann-Whitney U test to understand whether attitudes towards pay discrimination, where attitudes are measured on an ordinal scale, differ based on gender (i.e., your dependent variable would be "attitudes towards pay discrimination" and your independent variable would be "gender", which has two groups: "male" and "female"). Unlike the independent-samples t-test, the Mann-Whitney U test allows you to draw different conclusions about your data depending on the assumptions you make about your data's distribution.

Assumptions

- Assumption #1: Your dependent variable should be measured at the ordinal or continuous level. Examples of ordinal variables include Likert items

- Assumption #2: Your independent variable should consist of two categorical, independent groups. Example independent variables that meet this criterion include gender (2 groups: male or female), employment status (2 groups: employed or unemployed), smoker (2 groups: yes or no), and so forth.
- Assumption #3: A Mann-Whitney U test can be used when your two variables are not normally distributed.

To conduct the Mann-Whitney *U* test in SPSS, use the following steps:
- Click Analyze, click (mouse over) Nonparametric Tests, and then click 2 Independent-Samples
- You should now be in the Two-Independent Samples Tests dialog box
- Click on your (Test Variable), and click _ to move it to the Test Variable List: box
- Click on your (Grouping Variable), and click _ to move it to the Grouping Variable: box
- Click Define Groups
- Type 1 in the Group 1 box to indicate that Group 1 is the first level of your grouping variable.
- Type 2 in the Group 2 box indicating that Group 2 is the second level of your grouping variable.
- Click Continue
- Click Options, Under Statistics , Select [] Descriptive
- Click Continue
- Be sure Mann-Whitney U is checked in the Test Type area, Click OK

The test statistics summarized in Table 44 do not indicate any significant results across year 2009 to 2013, since all *p* values are greater than the standard level at 5 percent. The output indicates that the result, with correction for ties and Z-scores conversion, were not significant (p> 0.05) implying no significant differences in efficiencies exist between rural and urban banks across the time period of 2009 to 2013.

Table 44: Mann-Whitney Test for Differences

Year	Location	N	Mean Rank	Sum of Ranks
2009	Urban	10	9.75	97.50
	Rural	10	11.25	112.50
	Total	20		
2010	Urban	10	9.20	92.00
	Rural	10	11.80	118.00
	Total	20		
2011	Urban	10	9.00	90.00
	Rural	10	12.00	120.00
	Total	20		
2012	Urban	10	11.35	113.50
	Rural	10	9.65	96.50
	Total	20		
2013	Urban	10	9.00	90.00
	Rural	10	12.00	120.00
	Total	20		

Test Statistics[b]

	Year 2009	Year 2010	Year 2011	Year 2012	Year 2013
Mann-Whitney U	42.500	37.000	35.000	41.500	35.000
Wilcoxon W	97.500	92.000	90.000	96.500	90.000
Z	-.606	-1.004	-1.189	-.664	-1.159
Asymp. Sig. (2-tailed)	.545	.315	.235	.507	.247
Exact Sig. [2*(1-tailed Sig.)]	.579[a]	.353[a]	.280[a]	.529[a]	.280[a]
a. Not corrected for ties.					
b. Grouping Variable: Location					

Hypothesis Test summary

Null / Alternate	Hypothesis	Accepted / Rejected

Null	H3$_0$: *There is no signifcant difference between efficiency of Rural and Urban branches of SBBJ in Udaipur district*	*Accepted*
Alternate	H3$_1$: *There is signifcant difference between efficiency of Rural and Urban branches of SBBJ in Udaipur district*	Rejected

LIMITATIONS OF THE STUDY:
1. Udaipur Region is chosen as study area. Therefore as area wise it is limited.
2. The study uses a sample data for the period 2009-2013. Therefore if the period of analysis would be 10 or more year, the results can be more predictive.

IV. Conclusion

Overall performance of the urban branches of State bank of Bikaner and Jaipur of Udaipur district are performing comparatively better as compared to the rural branches of Udaipur. The reasons for this are that people of villages are still not aware of the banking. As their deposits and loans in rural area not as much as compared to the urban branches of Udaipur.

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